

Technical Memorandum

Memo No.	EPW00390 – Lighting Assessment - Aviation (30034151-RPT-3.1-001) – Revision 0	Date of Issue	22 May 2024
Subject	Lighting Assessment	Discipline	Civil
Project Title	Bundaberg East Levee	Project No.	30034151
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Prepared for	QLD Government - DHLGPPW	Attention to	Richard Alford
Attachments	N/A		

1. Introduction

1.1 Purpose

SMEC Australia Pty Ltd (SMEC) has been commissioned by the Queensland Department of Housing, Local Government Planning and Public Works (DHLGPPW) to undertake the Preliminary design of a flood levee wall, large flood gates and pump stations to protect East Bundaberg from flooding. As part of the Preliminary Design phase, SMEC is required to undertake a lighting assessment for the flood levee. This will determine the lighting standards to adhere to during design, construction and operation of the flood levee, identify any hazards lighting may cause to maritime and aviation operations, identify requirements in regards to street light reinstatement and any additional lighting that may reduce the potential for anti-social behaviour

1.2 Project Background

In 2019, detailed hydrologic and hydraulic modelling for river management and the concept design was undertaken for a flood wall, large flood gates and pump station to protect East Bundaberg from flooding. The Bundaberg East Levee (BEL) design will include a flood gate and pump station at the outlets of both Saltwater Creek and the unnamed “Distillery Creek”. The flood gates are to be closed during regional flood events as to prevent backwater flooding from the Burnett River.

The floodplain shape means that a relatively short length of levee can be built to enclose and provide protection to approximately 600 residential properties and approximately 350 commercial properties in the CBD and East Bundaberg, with the levee height specified to provide protection from a 1% AEP flood event. This will provide protection against a flood event equivalent to the 2013 event with circa 150mm freeboard.

2. Lighting

2.1 Aviation

Bundaberg Regional Airport lies approximately 5.7km south-west of the Bundaberg Eastern Levee site, which is within the 6km radius denoted by Road Planning and Design Manual (2nd Ed Vol. 6 Lighting Section 7.9) indicating that the levee site is in the vicinity of an aerodrome and is therefore required to adhere to the Civil Aviation Safety Authority (CASA) Standard Part 139. It is worth noting that the project remains outside of the 3nm Obstacle Limitation Surface (OLS) for the Bundaberg Regional Airport.

During construction and operation of the flood levee, light sources should not be pointed directly upwards, and lighting on site should not be installed in long straight lines that may mimic a runway.

As per AS/NZS 1158.1.1 – Lighting for roads and public spaces, installed street lighting should have limited waste light above the horizontal plane. As per the standards, luminaires should have a flat glass aero screen visor and installed with zero (0) degree or limited upcast angle to reduce the amount of upward lighting which has the potential to cause hazards to aviation.

2.2 Marine

The project is located adjacent to a Strategic Port area located within the Burnett River (Gladstone Ports Corporation). The project area is also located within a navigable waterway, specifically a high-risk maritime development zone which enhances the need for the levee infrastructure to maintain maritime safety. The design, construction and operation of the flood levee shall adhere to the Maritime Safety Queensland (MSQ) and Gladstone Ports Harbour Master requirements in relation to marine lighting.

The Harbour Master oversees and directs daily maritime/harbour operations, ensuring compliance with all safety, environmental and health regulations. The Harbour Master has a duty to inform vessels of any hazards and obstructions that will affect maritime navigation. As this project will comprise of large floodgate and pump station structures being constructed within the waterway, the Gladstone Ports Harbour Master will become a key stakeholder for this project. SMEC recommends the Project Team carries out early engagement with the Gladstone Ports Harbour Master to discuss marine lighting requirements to inform the design and construction works.

Additionally, the Queensland State Government's State Code 7: Maritime Safety is the assessment benchmark for a Development Assessment and should be adhered to. This code seeks to ensure the construction and operation of the development does not compromise the viable operation of aids to navigation, and safe operation of vessels in navigable waterways.

2.3 Street Lighting

Relocation/removal of street lighting caused by the placement of the levee wall and pump station design will need to consider the requirements of the AS/NZS 1158 – Lighting for roads and public spaces, as well as AS 4282-1997 – Control of the unobtrusive effects of outdoor lighting.

The street lighting design should consider any additional lighting that may be required to reduce the potential for anti-social behaviour that may present a public nuisance to adjacent properties.

3. Recommendations

SMEC recommends the following in relation to aviation and marine lighting for the design, construction, and operation of the BEL:

- During construction and operation of the levee, light sources should not be pointed directly upwards, and lighting on site should not be installed in long straight lines that may mimic a runway.
- As per AS/NZS 1158.1.1, installed street lighting should have limited waste light above the horizontal plane. As per the standards, luminaires should have a flat glass aero screen visor and installed with zero (0) degree or limited upcast angle to reduce the amount of upward lighting which has the potential to cause hazards to aviation.
- The design, construction and operation of the flood levee shall adhere to the Maritime Safety Queensland (MSQ) and Gladstone Ports Harbour Master requirements in relation to marine lighting. SMEC recommends the Project Team carries out early engagement with the Gladstone Ports Harbour Master to discuss marine lighting requirements to inform the design and construction works.
- The Queensland State Government's State Code 7: Maritime Safety is the assessment benchmark for a Development Assessment and should be adhered to. This code seeks to ensure the construction and operation of the development does not compromise the viable operation of aids to navigation, and safe operation of vessels in navigable waterways.
- Relocation/removal of street lighting caused by the placement of the levee wall and pump station design will need to consider the requirements of the AS/NZS 1158 – Lighting for roads and public spaces, as well as AS 4282-1997 – Control of the unobtrusive effects of outdoor lighting.

- The street lighting design should consider any additional lighting that may be required to reduce the potential for anti-social behaviour that may present a public nuisance to adjacent properties.